

# **Ionizing organic compound based nanocomposites for efficient $\gamma$ -ray sensor**

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## **ABSTRACT**

Thin film and nanocrystalline materials of oxides have been very attractive choice as low cost option for  $\gamma$ -ray detection and have shown great promise. Our studies on pure oxide films indicated that thickness and microstructure have pronounced effect on sensitivity. Since the interaction of  $\gamma$ -ray with composites involves all three interaction processes; photoelectric effect, Compton scattering, and pair production, composites containing ionic organics have better chance for enhancing sensitivity. In the composites of ionizing organics oxidation effect of unusual oxides changes much faster and hence increases the sensitivity of radiation. In this study, we have used nickel oxide and titanium oxide in ionic organics to develop composite materials for low energy  $\gamma$ -ray sensing. We prepared composites containing ethylene carbonate and evaluated the effect of commercial Cs-137 radiation source by studying current-voltage relationship at several frequencies. Radiated samples showed higher resistivity compared to as prepared composites.

**Keywords:** detector, radiation, current, morphology, composite,  $\gamma$ -ray, ethylene carbonate